GRASSHOPPER SPARROW (*Ammodramus savannarum*)

Philip Unitt, San Diego Natural History Museum, P. O. Box 121390, San Diego, CA 92112-1390; birds@sdnhm.org

Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
15	10	5	10	0	0	15

Special Concern Priority

Currently considered a bird species of special concern (year round), priority 2. Not included on previous lists.

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment (Sauer et al. 2000).

General Range and Abundance

As a species, the Grasshopper Sparrow has a transcontinental distribution in North America and ranges from southern Canada disjunctly south to Ecuador. The subspecies *A. s. perpallidus* occurs in North America from the Pacific coast east to the Great Plains but its distribution is very patchy. It is absent from large areas of desert, chaparral, and forest and rare or irregular in many areas where it occurs. It is regarded as rare and local in Oregon (Gilligan et al. 1994) and endangered in British Columbia (Cannings 1991). It is common only in the Great Plains, but numbers even there are declining with loss of habitat, conversion of pasture to row crops, and fire suppression (Vickery 1996).

Seasonal Status in California

The Grasshopper Sparrow is at least partly migratory; the occasional birds seen in winter at breeding localities may not be the same individuals there in spring and summer. In southern California the species is seen primarily from March to August (Garrett and Dunn 1981), in northern California, from the end of April to September (McCaskie et al. 1979). Although in San Diego

county the species is evident always by late March, sometimes by early March or very late February (Unitt 1984, pers. obs.), the earliest record for Southeast Farallon Island is for 28 April (Pyle and Henderson 1991), matching the arrival schedule in the mainland breeding range in northern California. On the Colorado River, spring migrants have been noted as late as 7 May (Rosenberg et al. 1991, in Death Valley, to 25 May (Garrett and Dunn 1981), and on Southeast Farallon, notorious for attracting lost migrants, to 2 July (Pyle and Henderson 1991). There is no great north/south difference in fall migration. On Southeast Farallon, dates of fall migrants extend from 20 July to 29 November, with a mean of 8 October (Pyle and Henderson 1991). In southern California, 10 and 11 August are the earliest fall dates for nonbreeding localities. Shuford (1993) and Tenney (1993) suggested that birds arriving in early spring at dry inland sites may shift later in the season to more humid grassland near the coast. Possibly, the proportion of the population that is nonmigratory increases toward the south. San Diego County bird atlas records (1997-2001) have revealed the species wintering at many sites where it nests. Because the Grasshopper Sparrow is so inconspicuous when not singing, data on its migration schedule and winter status are meager; further study (possibly entailing mist-netting in grassland) may well reveal currently unknown aspects of its distribution.

Historical Range and Abundance in California

Grinnell and Miller (1944) described the Grasshopper Sparrow as a summer resident from Mendocino, Trinity, and Tehama counties south, west of the Sierra Nevada and southeastern deserts, to San Diego County; also in Shasta Valley, Siskiyou County, and Pete's Valley, Lassen County. Their winter records extended north to Fresno County and the San Francisco Bay area. Willett (1912) considered the Grasshopper Sparrow "fairly common" though local in southern California, but Grinnell and Miller designated it "sparse and irregularly distributed," with known localities so few that all could be listed.

Recent Range and Abundance in California

Agricultural and urban development have left the Grasshopper Sparrow's naturally patchy California range even more fragmented. Nevertheless, more thorough knowledge has extended the range farther northwest into Humboldt and Del Norte counties (as far at Point St. George, Harris 1996) and filled in many interstices among the locations listed by Grinnell and Miller (1944). For example, the Sonoma County bird atlas effort (Rudesill 1995) located the Grasshopper Sparrow in twenty-one 5-km by 5-km squares in a county where it went unrecorded until 1975. Agriculture and urbanization have nearly if not completely eliminated the Grasshopper Sparrow from the floor of the Central Valley, dividing the species' California range into two disjunct strips along the coast and in the foothills of the Sierra Nevada. Along California's humid north coast, the Grasshopper Sparrow is found in prairies and pastures scattered in a largely forested landscape (Harris 1996). Such habitat becomes more widespread to the south in Sonoma and Marin counties, and Shuford (1993) found the Grasshopper Sparrow fairly common and widespread in Marin County, especially in "the low rolling hills of northern Point Reyes and east of Tomales Bay." From San Francisco Bay south to Point Concepcion the Grasshopper Sparrow is generally regarded as uncommon (e.g., Tenney 1993, Lehman 1994), though bird atlas data from San Mateo, Contra Costa, Alameda, Monterey, and San Luis Obispo counties show that it is still fairly widespread both along the coast and in the Diablo, Gabilan, and Temblor ranges. In coastal southern California the Grasshopper Sparrow has retreated greatly. Lehman (1994) found locations in Santa Barbara County few enough that all could be listed. In Los Angeles County known locations are now only in the extreme west near the Ventura County line and in the Whittier/Puente Hills (Cooper 2000, atlas data). In Orange County, Hamilton and Willick (1996) considered the Grasshopper Sparrow still "fairly common" in the remaining grasslands of the San Joaquin Hills and foothills of the Santa Ana Mountains, but Gallagher (1997) noted that the species had already been eliminated from four of 20 atlas blocks where it was located in the late 1980s. It is gone from the northwestern half of Orange County. In San Diego County, the species is now largely restricted to five disjunct blocks. Many sites support

only a few birds and many others have been lost to urbanization in the past 25 years. Much of the remaining population is on military bases, Camp Pendleton and Miramar Air Station. The Grasshopper Sparrow's current status in substantial sections of its range (Sierra Nevada foothills, San Jacinto Basin) has not been reported on in detail.

Ecological Requirements

The Grasshopper Sparrow's ecology varies substantially from region to region within its wide range, and although it has received substantial study elsewhere, very little has been done in California. Thus it is difficult to assess what aspects of the species' biology apply here. It appears, however, that in California Grasshopper Sparrows prefer grassland in which some native bunchgrasses persist and there a few scattered shrubs or taller herbs that offer elevated song perches. Grinnell and Miller (1944) listed a variety of generalized grassland-like habitats including alfalfa, and exceptional records of singing birds from the Imperial Valley have been from alfalfa fields (Patten et al. in press). Dawson (1923) mentioned a nest near Escondido in an alkaline meadow covered with saltgrass (*Distichlis*). Bunchgrasses (*Nassella*), though, are the dominant plant at most Grasshopper Sparrow sites. Shuford (1993) mentioned them as prevalent in the sparrow's habitat in Marin County, with coyote bush (*Baccharis pilularis*) and bracken fern as frequent but not invariable constituents. In San Diego County, the Grasshopper Sparrow's attachment to native bunchgrasses is clear. Though the species is found occasionally in unused agricultural fields or in stands of of wild oats, mustard, and ripgut grass, numbers in these habitats are far lower than in those where bunchgrasses are common (pers. obs.). Often the sparrow's habitat in this area is an ecotone between grassland and sage scrub, so there are scattered shrubs such as flat-top buckwheat or California sagebrush, used by the birds as song perches. This preference for bunchgrasses over sod-forming grasses has been noted elsewhere in the Grasshopper Sparrow's range (Whitmore 1981).

Bock and Webb (1984) in Arizona and Whitmore (1979, 1981) in West Virginia found Grasshoppper Sparrows in areas with substantial areas of bare ground (22.9 and 21.9%, respectively), and in West Virginia the birds were selecting these more open areas. Yet in Wisconsin Wiens (1969) found the reverse, the birds selecting dense grass with bare ground at only 2%. In Arizona, Bock and Webb (1984) measured the percentage shrub cover in Grasshopper Sparrow habitat at 4.5%. Various authors have reported percentage grass cover or height of grass in Grasshopper Sparrow territories, but Whitmore (1979) noted that this varies substantially over the season with the grass' growing. The species' ecology in dry western grasslands clearly differs from that in humid eastern ones.

Threats

Urbanization is the primary current threat to the Grasshopper Sparrow. Much of its California habitat lies in the path of expanding cities, especially in southern California. The grassland occupied by Grasshopper Sparrows typically grows on readily developed gentle slopes. Because of the habitat's having been used for grazing since the days of Spanish colonization of California, almost all is in private ownership.

This long history of heavy exploitation of California's grasslands has led to grave degradation of this habitat. Vast areas have been completely converted to nonnative annual species, with a great loss of habitat value to the Grasshopper Sparrow. Grazing is a negative factor over most of the Western Grasshopper Sparrow's range. Though in Oklahoma the species was found only in grazed tallgrass prairie, in southeastern Arizona it was eliminated by grazing (Bock and Webb 1984). Behle et al. (1985) ascribed the species' current rarity in Utah to a history of overgrazing. In the Lake Henshaw basin of north-central San Diego County, heavy grazing in combination with pumping out of groundwater confine the Grasshopper Sparrow to a few mesic microhabitats in an area where it would likely be widespread in lack of these factors.

Agriculture, often preceding urbanization, has greatly reduced Grasshopper Sparrow habitat. Few if any crops grown in California offer adequate habitat, and fallow and abandoned fields are colonized by weeds unfavorable to the sparrow.

Management and Research Recommendations

- Negotiate conservation agreements (allowing limited grazing, for example, but preserving grassland) or favorable zoning on private land.
- Especially in southern California, ensure that the importance of native grassland is recognized in habitat-conservation plans.
- Redirect urbanization away from native grassland.
- Manage as native grassland significant tracts of Grasshopper Sparrow habitat that come into public ownership (like Rancho Jamul in southern San Diego County).
- Minimize or prevent disturbance of the ground surface in native grassland, as this favors exotic weeds at the expense of native grasses.
- Investigate the effects of fire, by season, on native grassland and Grasshopper Sparrows in California.
- Investigate the species' population density and nesting success in native versus nonnative grassland.
- Investigate possible movements of Grasshopper Sparrows in the middle of the breeding season.
- Develop means for restoring native grassland (to the benefit of many species of both plants and animals beyond the Grasshopper Sparrow).

Monitoring Needs

Because of the Grasshopper Sparrow's widely dispersed distribution, a complete census is not possible. Rather, a network of survey routes scattered through the species' range is needed if the

population level is to be monitored. The number of sites monitored should be large, to average out the effect of the species' irregularity. Monitoring of the birds should be linked to monitoring of habitat conditions so the effects of changes in these can be better identified. The species likely spreads into marginal habitat after wet years. Observers monitoring the Grasshopper Sparrow need to be monitored themselves, as the species must be detected by song and the high-pitched song falls outside some persons' range of hearing.

Acknowledgments

Literature Cited

Behle, W. H., Sorenson, E. D., and White, C. M. 1985. Utah birds: A revised checklist. Utah Mus. Hat. Hist. Occ. Publ. 4:1-108.

Bock, C. E., and Webb, B. 1984. Birds as grazing indicator species in southeastern Arizona. J. Wildlife Mgmt. 48:1045-1049.

Cannings, R. J. 1991. Status report on the Grasshopper Sparrow *Ammodramus savannarum* in British Columbia. Br. Columbia Ministry of the Environment, Vancouver.

Cooper, D. S. 2000. Breeding landbirds of a highly threatened open space: The Puente-Chino Hills, California. W. Birds 31:213-234.

Dawson, W. L. 1923. The Birds of California. South Moulton Co., San Diego.

Gallagher, S. R. 1997. Atlas of Breeding Birds: Orange County, California. Sea and Sage Audubon Press, Irvine, CA.

Garrett, K., and Dunn, J. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Soc., Los Angeles.

Gilligan, J., Rogers, D., Smith, M., and Contreras, A. 1994. Birds of Oregon: Their Status and Distribution. Cinclus, McMinnville, OR.

Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Hamilton, R. A., and Willick, D. R. 1996. The Birds of Orange County, California: Status and Distribution. Sea and Sage Press, Irvine, CA.

Harris, S. W. 1996. Northwestern California Birds, 2nd ed. Humboldt State Univ. Press, Arcata, CA.

Lehman, P. E. 1994. The Birds of Santa Barbara County, California. Vert. Mus., Univ. Calif., Santa Barbara.

McCaskie, G., DeBenedictis, P., Erickson, R., and Morlan, J. 1979. Birds of Northern California: An Annotated Field List. Golden Gate Audubon Soc., Berkeley.

Pyle, P., and Henderson, R. P. 1991. The birds of Southeast Farallon Island: Occurrence and distribution of migratory species. W. Birds 22:41-84.

Rosenberg, K. V., Ohmart, R. D., Hunter, W. C., and Anderson, B. W. 1991. Birds of the Lower Colorado River Valley. Univ. Ariz. Press, Tucson.

Rudesill, R. 1995. Grasshopper Sparrow, in Sonoma County Breeding Bird Atlas (B. Burridge, ed.), p. 165. Madrone Audubon Soc., Santa Rosa, CA.

Sauer, J. R., Hines, J. E., Thomas, I., Fallon, J., and Gough, G. 2000. The North American Breeding Bird Survey, results and analysis 1966-1999. Version 98.1, USGS Patuxent Wildl. Res. Ctr., Laurel MD (http://www.mbr-pwrc.usgs.gov/bbs/bbs.html).

Shuford, W. D. 1993. The Marin County Breeding Bird Atlas. Bushtit Books, Bolinas, CA.

Tenney, C., 1993. Grasshopper Sparrow, in Atlas of the Breeding Birds of Monterey County, California (D. Roberson and C. Tenney, eds.), pp. 356-357. Monterey Peninsula Audubon Soc., Carmel, CA.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. Nat. Hist. Memoir 13.

Vickery, P. D. 1996. Grasshopper Sparrow (Ammodramus savannarum), in The Birds of North America (A. Poole and F. Gill, eds.), no. 239. Acad. Nat. Sci., Philadelphia.

Whitmore, R. C. 1979. Short-term change in vegetation structure and its effect on Grasshopper Sparrows in West Virginia. Auk 96:621-625.

Whitmore, R. C. 1981. Structural characteristics of Grasshopper Sparrow habitat. J. Wildlife Mgmt. 45:811-814.

Wiens, J. A. 1969. An approach to the study of ecological relations among grassland birds. Ornithol. Monogr. 8:1-93.

Willett, G. 1912. Birds of the Pacific slope of southern California. Pac. Coast Avifauna 7.